TITLE: ATTENTIONAL BIAS AND CHRONIC PAIN: WHERE TO GO FROM HERE?

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Number of text pages: 2

Number of tables: 0

Number of figures: 0

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Attentional bias (AB), or selective attention for information related to the emotional concerns of patients, is an ubiquitous and well-validated phenomenon in many forms of psychopathology [1]. Also patients with chronic pain display an AB towards pain-related information, although it is not as robust as is often assumed [5,15]. Despite extant research several challenges remain, and, there is a strong need for systematic investigations in large samples [5].

Sharpe and her group have taken up some of these challenges. They started a systematic research program related to three key questions: (1) "Does AB exist?", (2) "Does AB matter?", and (3) "What can we do about it?" (e.g., [7,14]). Indeed, demonstrating that AB exists, is no guarantee that it is relevant for understanding and treating the variety of problems that patients with chronic pain experience. For example, AB may just be an epiphenomenon of the presence of (chronic) pain or anxiety. The study of Sharpe and colleagues in this issue addresses the "Does it matter?" question. More specifically, Sharpe and colleagues employed a well-validated AB paradigm (a dot-probe task) in a large sample of (sub-)acute low back pain (LBP) patients to investigate whether AB towards pain-related information (i.e., words related to sensory pain, affective pain, threat or disability) are predictive of pain problems becoming chronic. Results indicate that patients with LBP show only an AB towards sensory pain words, and this result was present in both the (sub-)acute and chronic pain phase. However, AB towards sensory pain-related information was not predictive of chronicity. In fact, only directing attention away (i.e., attentional avoidance) from affective pain-related information was.

These findings are intriguing. They corroborate the view that AB matters in the development of chronic pain problems. However, they challenge current thinking about the role of AB in pain. Indeed, the schema-enmeshment model of pain hypothesizes exactly the opposite, i.e., that an AB towards affective pain stimuli predicts disability and the development of a chronic pain disorder [13]. Also other theoretical accounts (e.g., [4,20]), hypothesize that an AB towards pain-related information results in worse pain-outcomes (e.g., disability). These hypotheses were however not confirmed in the study of Sharpe and colleagues. So, where to go from here?

Evidently, there is a need for more research to replicate the findings and to explore the role of potential moderators. It may well be that a distinction has to be made between early and late stages of information processing. According to the vigilance-avoidance hypothesis AB towards pain-related information may be found early in time (≤500ms), but may reverse and become attentional avoidance later on (>500ms) [11,12]. As yet, there is no evidence for this idea [5,15].

Research on attentional bias has substantially increased during the last years. In doing so, most researchers have adapted experimental paradigms and models of attentional bias from experimental psychopathology. However, the assumptions that underlie these paradigms and models remain often

untested for chronic pain [3,5]. Largely underdeveloped are theoretical accounts of attentional bias that explain how and when AB emerges in chronic pain, and that explicate how exactly AB affects the problems that patients face. At present, the outcomes of interest vary substantially from study to study (i.e., pain intensity, pain behavior, disability, distress, development of chronic pain), and the patterns of results are inconsistent across these studies [2,9,18,19]. Therefore, we call for more theory and hypothesis-driven research. As a starting point, we propose two guiding propositions: First, AB does not directly influence the experience of pain, but hampers the ability of individuals to direct their attention away from pain [4]. This proposition can easily be tested in experimental settings (e.g., [17]), and also in clinical settings, but then probably requires more sophisticated operationalisations of key outcomes. For example, a diary study of Van Ryckeghem and colleagues reported that the association between daily self-reports of pain intensity and disability was stronger for those chronic pain patients with a strong AB towards pain-related information [18]. Second, AB emerges not because of structural deficits in attention, but because pain is experienced as threatening in patients. This idea is not new, and has many predecessors [6,11]. As such, AB is a dynamic and situated phenomenon that is influenced by both the context and the learning experiences of the patient. Nevertheless, this proposition is not without clinical implications. In the field of psychopathology, there is an increasing popularity to target AB by teaching patients to direct their attention away from their emotional concerns. Initial positive results with this strategy have been reported in chronic pain [14] and in psychopathology [8]. However, we may ask ourselves whether interventions that target the meaning or the threat value of pain are not more effective? Clinical psychologists have a plethora of techniques to accomplish this goal, such as decatastrophizing [16], exposure therapy (challenging erroneous beliefs about pain) [21] or several techniques of Acceptance and Commitment Therapy [10].

Conflict of interest statement

The authors declare that they have no conflict of interest.

Acknowledgment section

Preparation of this editorial was partly supported by Grant BOF/GOA2006/001 of Ghent University and FWO Project G.017807.

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